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ABSTRACT

In 1977, almost 60 percent of all Open University courses were using audio and visual media in combination: either sound broadcasting with visual materials or audio-vision with the sound distributed on cassette or discs. Research has shown that students prefer radio-vision to radio alone. It appears that future growth may be in the area of audio-vision and away from dependence on radio as the sound source. This is the result of a growing need to cater to the individual learner and to optimise the learning opportunity. It is possible that the growth of audio-vision will enable radio to develop a more appropriate and significant learning role. Research relating to radio-vision and audio-vision is described. (Author/STS)

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RADIO AND AUDIO-VISION IN THE BRITISH OPEN UNIVERSITY: TOWARDS INDIVIDUALIZATION

BY

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Radio- and Audio-Vision in the British Open University: towards individualization

Introduction

In 1977, almost 60% of all Open University courses were using audio and visual media in combination - either sound broadcasting with visual materials, or audio-vision, with the sound distributed on cassette or disc. It is not surprising that a distance learning institution should include these media among its audio-visual technologies. Programmes in which the student works through visual material guided by a sound source have been used extensively at most levels of education. But what is of interest is the extent of usage in the Open University, and the range of visual materials supplied to students. The popularity of the radio-vision medium has resulted in some innovation, and the growth now of audio-vision (sound component distributed on cassette or disc) may herald a radically different approach to distance learning, complementing the use of radio.

Interest in radio-vision arose partly because of concern over low listening figures. But, there is no doubt that some courses, because of the nature of the subject, needed to support the spoken word with illustration. At the simplest level, having a visual support does seem to help concentration. It is easy enough for the mind to wander during a twenty minute radio talk or discussion. To support what is said by an illustration or an activity helps to concretize the subject matter. It is certainly a deliberate decision, involving more time and effort on the part of producers. Research has shown that students do prefer radio-vision to radio alone, and this surely is enough to support arguments for more of it. (1) More recently, interest has begun to swing towards audio-vision. For various reasons, it appears that future growth may be in the area of audio-vision, and away from dependence upon radio as the sound source. Not the least of these reasons is the need to cater for the individual learner and to optimise the learning opportunity.

The Individual Leaner Versus the Mass Media

Using the airwaves seemed the best and most obvious way of reaching the Open University's vast numbers of students, all working at home. With 55,000 students the idea of harnessing the mass media to serve a mass educational need has earned the University a world-wide reputation. In 1977, the Open University is occupying a total of sixty one and a half hours per week of national radio and television time.

But, these sixty one hours are distributed between 110 courses, and more than half of these courses are followed by less than 500 students. So, although collectively there is a mass audience for programming, the student body consists of relatively small groups, each following separate courses. And, with more new courses and limited transmission time, the squeeze is being felt. At present, 43 courses have only one radio transmission. Originally, all programmes were repeated during the same week. In 1978, 52 courses will have only one transmission instead of two. Simply, there is not enough broadcast time to go around. Already the University's Audio-Visual Media Research Group, led by Dr. Tony Bates has carried out a study of 'Alternative Media Technologies for the Open University'. (2) This shows the range of alternative audio-visual media which might be available in the future if the problem of using broadcasting increases as predicted. But quite apart from logistical and cost questions, there is a need for more individualized audio-visual media programming.

The Open University's learning system was structured with prescribed pattern of behaviour for the distance learner in mind. This is clearly revealed in the decision to divide courses into 'Units' of work, each of which is expected to take one week to complete, allowing ten to twelve hours study. Originally, the Unit was composed of printed text, a radio and television programme (with two transmissions each), and sometimes, experimental work. What is more, it was thought that students would keep to these weekly schedules, and that broadcasts would help to 'pace' them.

Studies carried out by the A/V Media Research Group as early as 1973 (3) showed that, although study schedules were based on the idea of students using the weekly broadcasts to 'pace' themselves, few used broadcasts in this way. Open University students realised that the compulsory assignment was what counted in the University's continuous assessment scheme. Accordingly, they paced their work with an assignment cut-off date in mind. And, as this cut-off date is often four to six weeks behind the ideal time for completion of a study block, most students were working up to one month behind. Broadcasts timed to fit in with a theoretical weekly work programme were out of step with practice.

Those who are pressed for time cut out radio listening. (4) All the evidence indicates that, with very few exceptions, students regard radio as the most dispensable course component. A smaller percentage cut out television viewing. The longer the student is in the system, "the more he considers broadcasting 'expendable'" judging for himself what is most valuable and pertinent. (5) These judgements are made on the ground of relevance, not

laziness. The broadcasts are the first to go because, as they are only transmitted once or twice a week, the student has to make more sacrifices to use them. Predictably, they are held up to a closer scrutiny, and eliminated if they are not right on target.

Perhaps in an effort to lift viewing and listening figures, some Course Teams have begun setting assignment questions on broadcast, thus making them compulsory viewing and listening. Research currently being carried out by Kern (6) shows that students do see this form of assessment, as it is currently being used in some courses, as an attempt to make sure that they view and listen. They resent the intrusion, feeling that it prevents their appreciation of the programme as a whole and turns their study into a quiz which undermines their status as degree level students.

Some attempts to increase the utilization of broadcasting have focussed on improving the programming. One of these, the use of visual support materials and student activities during sound broadcasts has promoted innovation in the area of radio and audio-vision.

Research into Audio-Vision

A number of studies have been carried out into the learning effectiveness of using sound with a visual support. Usually, these have been comparative effectiveness studies (7) in which radio and television and tape/slide were tested alongside, and the students' acquisition of knowledge or skills using the three media, compared. Results showed, on the whole, that the medium of tape/slide was 'at least as effective' and that, in some cases, students preferred this medium. The most sophisticated is the synchronized sound/35mm. slide system, where pictures are projected onto a classroom wall or screen or the study carrel. Cost and portability factors make these systems unsuitable for the Open University, where students are working at home. Instead, they are each sent sketches, diagrams, photographs or strip films packaged in media booklets or as broadcast supplements to use in conjunction with radio or sound tape.

Growth in the University's use of radio and audio-vision has been haphazard and for this reason a survey was begun in 1976, (8) to discover the range, extent and cost of these media. This study was continued in 1977 and located 64 courses (out of a total of 110) which combined visuals with sound. The variety of visual materials was vast and included film strip, coloured postcards, maps and charts, and objects such as rock samples and plastic replicas of materials. Course Teams had also chosen various means of showing the materials, and there were several types of viewing lens, stereo viewer, and even a

magnifying eyeglass.

Variation between visual support to the programmes was found to be considerable. Some of the most effective were those with simple line-drawings reproduced in Broadcast Supplements. Others consisted of several books with scattered illustrations incorrectly labelled requiring unrealistic pre-broadcast preparation and considerable dexterity in juggling between visual sources. A number of courses had invested heavily in coloured illustrations or sophisticated viewers, yet made little use of them during the programme in proportion to the cost. Students were sometimes expected only to follow the illustrations, while in other cases they joined in activities, such as completing formulae, sorting cut-outs or analysing samples of materials. It was apparent that just as the materials varied enormously in cost, and the quality of the design, so did Course Teams' estimation of the individuals' ability to manipulate the materials and absorb the content within a limited period, i.e. when the sound is broadcast.

Two other studies of radio-vision were carried out by Berrigan in 1976/77. (9) Both of these were based on a third level geology course which makes extensive use of the medium, and has developed a number of interesting techiques for displaying the visual component. The studies were in the form of an evaluation of one radio programme during which students view stereo photographs described and analysed in the radio programme using a commercially produced "Viewmaster". In the first study, a sample of 188 students replied to the questionnaire on the programme after it was broadcast. In the second study, a small group of fifteen students were sent a cassette of the programme and were asked to complete a form, while listening, to test for pace, clarity of the stereo vision, and need to stop the cassette to locate the features referred to. Response to both of these studies confirmed the fact that radio-vision programmes are popular, and that students find them extremely useful. An important finding of the broadcast study was that students who listened to the programme and examined the photographs fared about 50% better on a simple performance test than those who merely read the guidelines and examined the photographs. Hearing the description did increase understanding.

This study was partly concerned with the effectiveness of the particular viewer, and the extent to which it aided students to 'see' in 3-D. But most of the findings are relevant to the use of radio-vision generally. Firstly, a significant proportion of listeners reported that they had difficulty in concentrating for the duration of the programme, and suffered eye-strain, headache or both, through concentrating and holding the viewer to their eyes for twenty minutes.

This would apply to any hand-held viewer, and to any programme which demanded unbroken concentration on a small slide held to the eyes. This data was further supported by evidence obtained from the small group of students who responded to the second study, and who listened to the same programme on cassette. These students indicated points in the programme where they would have preferred to stop the tape, to make sure that they had located particular features accurately. These were then invited, following the first, uninterurupted listening, to listen to the tape as many times as they wished, and to stop where they wished, and to report their actions. The result was that many of them listened to particular sections as many as eight or nine times, until they were satisfied that they had successfully mastered the material. Almost all of these students commented on the fact that they found the distribution of such programmes on cassette much more satisfactory than broadcast. A considerable proportion of respondents in the broadcast study made the same comment. Obviously, the fact that the tape could be stopped allowed students to rest, and to continue the analysis at their own pace.

Guidelines for Radio/Audio-Vision

From these studies and the collection of examples of programming, an audio-visual instructional package has been compiled (10). This consists of a cassette, and a box containing eighteen examples of radio and audio-vision materials. The package is intended for use by University staff to demonstrate the range of materials available and possible combinations of sound and vision. It contains a guiding commentary with extracts from radio, cassette or disc programmes, to show how the materials are intended to be used. Throughout the commentary, 'good' and 'poor' design features are noted, programmes having been chosen to illustrate particular educational and design features.

The three projects (research into OU uses of radio-vision and the Geology Studies), confirmed the view of the researchers that much more effort, to date, has been poured into the provision of elaborate visual support material for radio/audio-vision programmes than has been given to the design of the sound component. Many radio-vision programmes overload students, requiring sustained concentration as well as expecting a great deal of pre-broadcast preparation to assemble materials. Often, programmes seemed to race through the material, allowing insufficient time for the detail to be located, or absorbed.

One of the main points the research revealed is the limitation of radio as a sound source. Many radio-vision programmes have been designed with a pre-determined work pace in mind and when they broadcast, can make no allowance for individual learning styles or varying speeds of comprehension. Also,

because the student is likely to hear the programme only once, use of the materials is limited, despite the sometimes considerable investment which has gone into their preparation. Once the listener fails to locate a reference he is likely to lose concentration, and to miss valuable information while trying to find his way back into the flow of the programme.

Where there are both sound and vision to absorb it seems vital that the student has the opportunity to work through the material as many times as he needs. Many radio-vision programmes contain concentrated teaching material, with little discursiveness or personal comment. They often teach skills, teach analysis of photographs, models,tables or maps or require students to work through examples. Because of the precision, they do demand complete concentration for the duration, if the techniques demonstrated are to be absorbed. As such, there is a real need to allow for different styles and rates of working.

Radio programming cannot allow for these differences, and there has been a tendency to overload them. There is a clear dividing line between those sound/vision materials which are suitable for broadcast, and those which, if they are to be effective, should be distributed on cassette. Radio is a suitable means of distribution where the visuals are used simply as an aid to concentration, or as a means of focussing attention. Indeed, almost all radio programming which is educational (rather than educative) would benefit from visual support of this type. These could take a simple pictoral or diagrammatic format in broadcast supplements.

But, where the purpose is to teach a skill, and where students have to perform an activity, individual differences need to be allowed for. To require students to carry out analytical or practical tasks within a set broadcast period is to burden both the students unnecessarily, and the broadcast medium. It is well-nigh impossible to produce a straight radio programme which is paced to suit the needs and abilities of a large number of students, and at least doubly difficult to produce a complex programme using visual support material for the same audience. In educational terms, it is rarely the <u>speed</u> with which a student works through material which is the critical factor-it is the level and depth of understanding which is achieved which counts for success or failure of the learning materials. Because of the time limit, radio is limited in the educational tasks it can perform.

The Individual and Audio-Vision

Radio-vision may have gained popularity as a means of improving radio listening figures, but more fundamental educational reasons are behind the move to individualized packages with the sound component distributed on cassette, or disc. Student control over the sound source allows for programmes to be fully utilised, and in ways which suit individual learning styles and work schedules.

One of the features of radio is that as a mass medium it can reach thousands or millions, at the same time. And, where large numbers have to be catered for. it is an economical way of reaching them. But, within the Open University learning system, these advantages hardly apply. There is really no need for every student on a course to be listening to a programme at precisely the same time even though they do need to cover the course at roughly the same pace. In fact, because Open University students have a full working life, they have to fit their studies in, often at odd times. Frequent repeats of programming would make it possible for more students to listen, but with restricted transmission time, this is not a solution. This restriction is likely to continue, and to grow more severe. And where the aim is not primarily to reach everybody at the same time, but simply to reach them, the advantages of materials which can be listened to only once begin to wane.

Educationally the learner needs to have access to the learning material when he needs it, and as often as he needs it. By providing programming on cassette or disc, this problem is overcome. The economic argument has also worn thin. The recent study "Alternative Media Technologies for the Open University" (11) (Bates and Kern 1977) shows that for courses with up to 500 students, it is as cheap, or cheaper, to distribute cassettes, as to broadcast. The study recommends that for courses with up to 1000 students, it is the educational reasons and not cost which should be given the greatest emphasis. As courses with less than 300 students now use a quarter of the programme allocation it seems that a reduction in the number of courses using the broadcast outlet would mean more favourable transmission times and more repeats for those with large student numbers.

Already, new courses in production are opting for cassette or disc distribution. Two are the new Mathematics Foundation Course, and the Science Foundation Course, M101 and S101 respectively. These courses have 3000 to 4000 students each. The Mathematics Faculty had had problems with radio, finding it difficult to select suitable subject matter, and to treat topics which are relevant enough to attract students. The Graphics Communication Group within the Maths Faculty has put much of its effort into developing audio-cassettes and work books. In 1978, when the course goes out, a carefully tested, well designed audio-vision package will be distributed to all 3000 students. The work book contains frames, each of which is a stage in a particular problem. The frames are set out diagrammatically, with very little printed commentary. Interestingly, the Maths package has a cartoon flavour, with a bizarre absent-minded Professor providing solutions, or pointing to problem areas. Clouds are used to present answers, or to highlight stages in solutions. It is estimated that each fifteen minutes of cassette material will take up to one hour for the student to work through. Often, the programmes involve the student in activities; spaces are left for equations to be completed, or steps towards solutions to be filled in. They are all participatory. Details of the Science Foundation Course are still to be finalised, but it is clear that these, too, will make most of student involvement. There are to be about five hours of audio-vision material, divided between the 32 units of work.

Other interesting projects have included a Technology/Mathematics inter-faculty course, which posted all students a flexible disc, a booklet and a slide rule, the object of which was to teach students the skill of using the slide rule. And, a music course which distributed nine LPs, with musical scores for students to follow as part of a programme of musical analysis.

Already 69% of Open University students have access to cassette recorders, (12) and growth will continue. The advantages of cassettes now seem obvious. They allow the student to develop his own way of working. As a text allows students to underline, make notes, skim, read several times, or read carefully once, to dip into or pour over, the cassette is just as flexible. Students can use it in the way which suits their particular approach to study. This is particularly important where it is a skill which is being taught, for it allows repetition and practice. It also enables students to work at their own pace, and to work privately. For slower students the cassette is ideal.

Another advantage, paradoxically, is that Course Teams can guarantee that students can hear and use the material. This they cannot do with radio, where extensive broadcast notes or even transcripts have sometimes had to be sent to make sure that all students had access to the material.

A not so obvious advantage of audio-vision is that it can be more 'personalised'. Students have remarked that it is something very close to an individual tutorial. Unlike radio, the voice guiding the students through the material can sound more intimate, more relaxed, using more colloquial language. The teacher can talk at his own pace, because the student can stop listening when he likes and for as long as he likes.

The Future

At the Open University, the use of cassettes or discs with slides, booklets viewers, samples and countless variations of print, is used in addition to radio and TV. It has been shown that the trend seems to be away from radio programmes but, need it mean a move away from radio altogether? Can the mass medium compete where greater individualization is called for, and where, at the present time, Course Teams are beginning to realise the limitations of broadcasting compared with tape? It is difficult to select one educational advantage that radio might have over tape or disc.

The problem with radio stems largely from its use as a mass medium, catering for mass students with predictable work programmes, when we now know that the individual differences are vast, and infinitely varied. As the advantages of audio-vision become known more precisely, then too the role for radio should become more clearly defined. Given that we have three audio-visual media (television, radio and audio-vision), there seems no need for all courses to use all three, simply because they are available. More importantly, we should be able to leave the choice to the student. That is, we can use certain media (such as radio) to cover aspects of the course which are optional, or additional, and allow the learner some flexibility.

Arguments against this kind of flexibility are that radio and television would then occupy a lesser place and that students would simply ignore them altogether. But 'optional' and 'additional' does not necessarily mean non-essential. Radio could provide extras such as more difficult or specialist material, remedial tuition, or deal with aspects of the course not covered elsewhere. And, students could be given the opportunity in assessment to demonstrate that they had used the programming.

Perhaps too the alarm over radio listening figures has been exaggerated. After all, about 50% of students listen fairly regularly to radio programming, and about 80% listen to some programming. Realistically, this is very successful. How many students in conventional colleges attend all lectures, tutorials and seminars? A less than 100% attendance doesn't mean failure of the system. If radio is to be used for the 'high fliers' or for the weaker students it has to become more specialised, more individualised. Students have to be informed about this policy, so that they make the choice, instead of using artificial and arbitrary testing to enforce listening. In being more selective at the planning end, we can allow students to select too. Radio (and television, for that matter) do offer a different dimension. They have an immediacy and can provide a coherent picture of a subject, bringing together a member of topics or theses in a non linear way. For material which warrants listening to once only, such as advice on assignments, examinations, assessment, summer schools or study techniques, radio is appropriate. Similarly, it could deal with those special areas referred to above.

There now seems no doubt that audio-vision, as a learning tool, will play an increasingly important role as one of the Open University's media. Rather than being seen as a threat to the existing broadcast component, it promises to allow radio to develop a more appropriate and significant role than in the past. At the same time, we can continue to discover exciting innovation in the use of audio-cassettes.

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